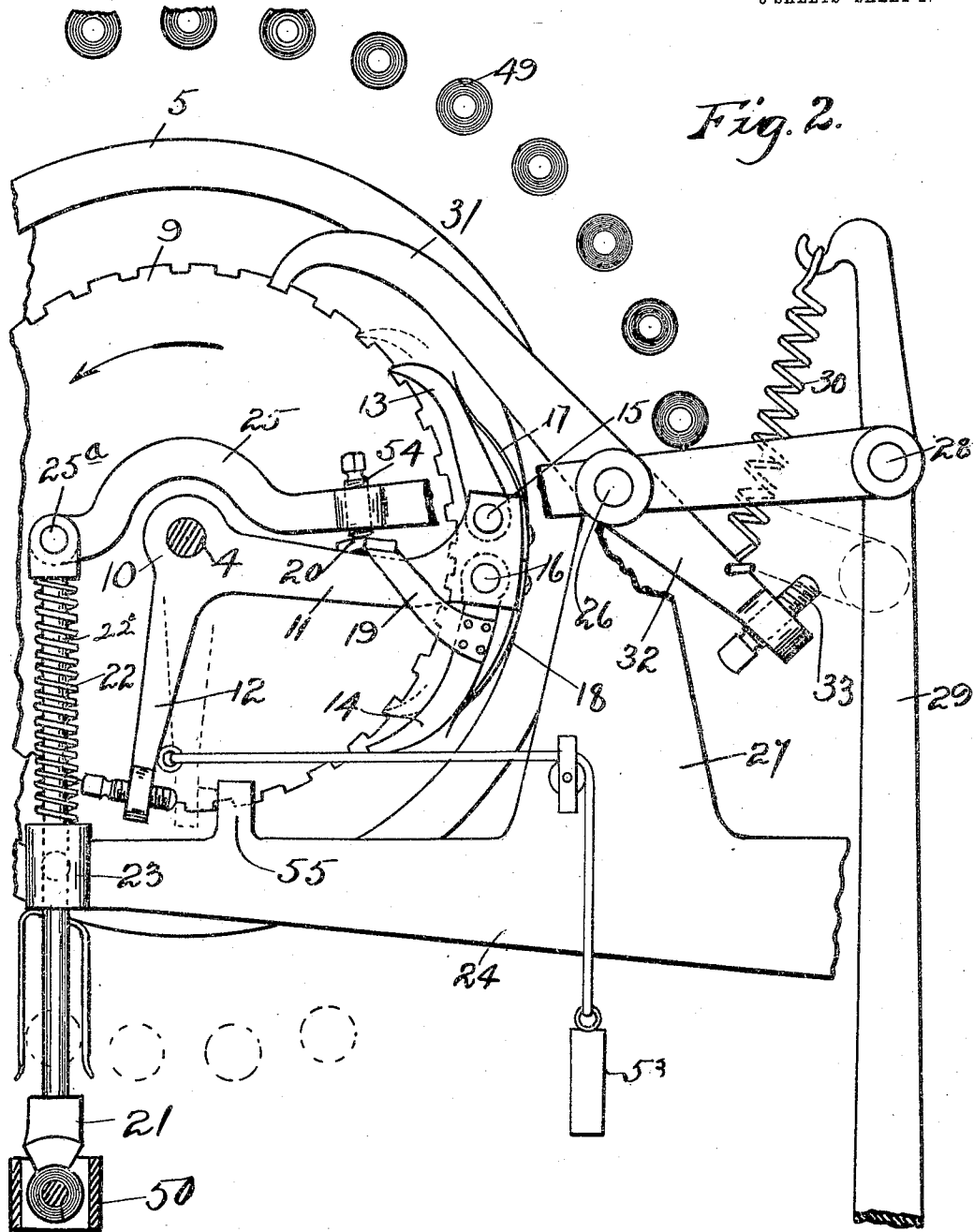


F. O'DONNELL.
WEFT REPLENISHING MECHANISM FOR LOOMS.
APPLICATION FILED SEPT. 17, 1904.

3 SHEETS—SHEET 2.



Inventor

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Witnesses

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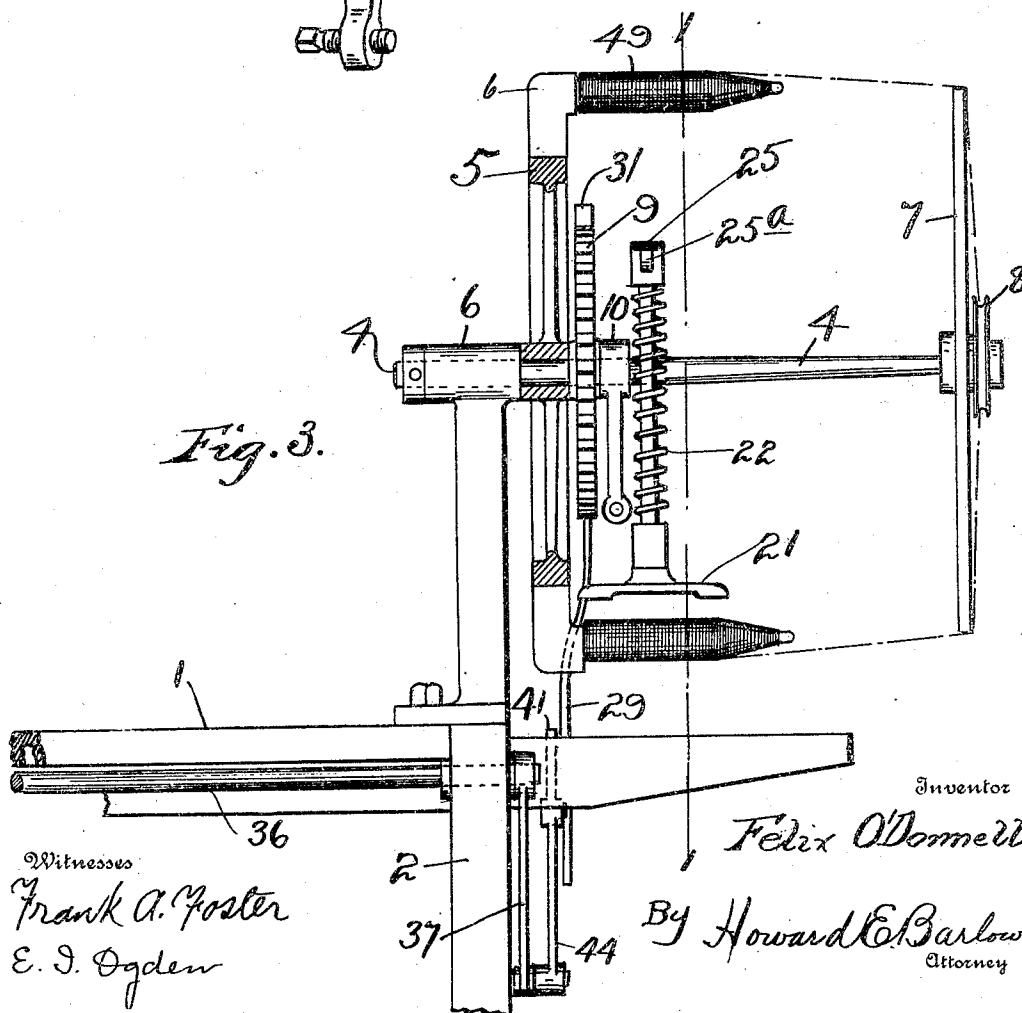
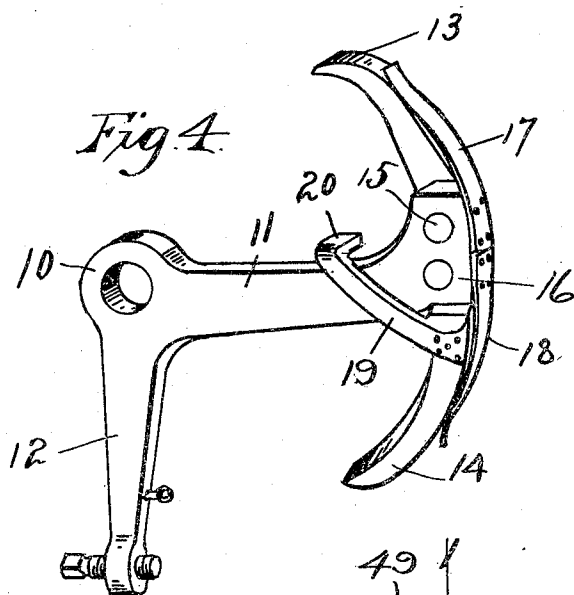
By

Howard E. Barlow
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

FELIX O'DONNELL, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO SUSAN A. BROWN, OF PAWTUCKET, RHODE ISLAND.

WEFT-REPLENISHING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 794,377, dated July 11, 1905.

Application filed September 17, 1904. Serial No. 224,853.

To all whom it may concern:

Be it known that I, FELIX O'DONNELL, a resident of the city of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Weft-Replenishing Mechanism for Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to looms, more particularly to that class which are provided with automatic weft-replenishing mechanism for weaving whereby a fresh supply of filling is automatically transferred from the magazine to the shuttle when the supply of filling has been exhausted or the thread broken.

The object of the invention is to provide improved mechanism of very simple construction and of positive action and which may be readily attached to the ordinary loom now in use, if desired.

The invention consists of other novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the appended claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all views.

In the drawings, Figure 1 represents a transverse section of the loom, showing a sufficient portion to be understood, with my improved device attached thereto, showing the mechanism of the automatic filling-replenishing apparatus in its normal position, section taken on line 1 1 of Fig. 3. Fig. 2 represents an enlarged view of the automatic filling-replenishing apparatus in the position taken when driving a bobbin into the shuttle. Fig. 3 is a front view of a portion of the loom, showing my device attached thereto, partially in section. Fig. 4 is a perspective view showing a detail of the bell-crank and the ac-

tuating-pawls attached thereto. Fig. 5 shows the position of the cams and levers as a fresh bobbin is about to be struck into the shuttle.

Referring to the drawings, at 1 is the loom breast-beam, and 2 2 the end frames, on which frames are set the ordinary loom-arch 3.

At 5 is the rotatable magazine or filling-feeder. All around the periphery of this wheel are fixed spring-fingers 6, each pair of fingers being especially designed and adapted to engage one end of a cop or filling-carrier and firmly support it in a horizontal position while it is being carried around under the foot of the plunger. This wheel 5 is mounted on and fixed to the shaft 4, which shaft is supported to turn in the bearings 6, (see Fig. 3,) said bearing being supported from the frame 2. This shaft extends out beyond the cop-wheel and has mounted upon it the filling-end support 7 and the filling-end holder 8. The ratchet-wheel 9 is also mounted on and fixed to the shaft 4, so as to turn with it and the filling-carrying wheel. The teeth in this ratchet-wheel are preferably made square and spaced to correspond to the spacing of the cops on the wheel 5, so that each time the ratchet is moved ahead one tooth a fresh bobbin is brought into position to be struck down into the shuttle, as will be hereinafter described.

At 10 is a bell-crank lever mounted to turn freely on shaft 4, said lever having a horizontal arm 11 and a depending arm 12. On the end of arm 11 are pivotally mounted the two pawls 13 and 14 on pins 15 and 16. Fixed to the outer end of this arm are the flatsprings 17 and 18, that press on these pawls 13 and 14, respectively, to hold them normally into engagement with the teeth of the ratchet-wheel 9. On the pawl 14 is fixed a finger 19, that extends up and over the top edge at 20 of its supporting-arm 11. By pressing downward on this portion 20 of the finger the pawl 14 may be thrown out of engagement with the teeth of the ratchet-wheel 9, and the arm 11, with its pawls, may then be car-

ried downward for another tooth into the position shown in Fig. 2 without turning the ratchet-wheel 9.

The transferrer comprises an arm or lever 5 25, pivoted in an arm 27 of bracket 24, said lever having a plunger-spindle 22^a, pivoted thereto at 25^a. Said spindle is provided with a plunger-foot 21 and is free to reciprocate in a bearing 23, pivotally supported at 10 23^a by bracket 24, whereby the same is free to adjust itself to the circular movement of the upper end of the spindle. To the opposite end of the lever at 28 is pivoted the upright lever 29. The upper end of this latter 15 lever extends up above the pivoting-point, forming a hook to which the spring 30 is attached.

At 31 is the ratchet-wheel-locking pawl that is also pivoted to the bracket at 26. The 20 outer end of this pawl is shaped to fit the square notches in the ratchet-wheel and securely lock said wheel and the cop-wheel from moving in either direction while the filling is being driven into the shuttle. The opposite end of this pawl extends back of the 25 pivoting-point at 32 and engages the under side of the plunger-lever 25 by the screw 33, which may be adjusted to regulate the height of the locking end. This pawl is held up 30 against said lever by the tension of spring 30, which spring serves the double purpose of holding this pawl in position and also to exert a tension on the upper end of the upright lever 29 to swing its lower end into position 35 for the purpose hereinafter specified.

At 33^a is the ordinary weft-fork mounted to slide in the usual way on the breast-beam, and at 34 is the usual two-arm cam-actuated 40 lever that operates the fork when there is no weft-thread to raise its end out of the path of said reciprocating lever. One end of the arm 35 engages the rear end of the fork-slide and is fixed at its opposite end to the shaft 36. This shaft extends along under the 45 breast-beam and has the depending arm 37 fixed to its opposite end.

At 38 is the crank-shaft, on which is mounted the rotating cam 39. Above this cam is located the cam-bar 40, which is held up and 50 just out of engagement with said cam by means of the latch 41. This latch may be withdrawn from the notch 42 in the end of the cam-bar and allow said bar to drop and engage said rotating cam when the weft-fork 55 fails to find the weft-thread, which is done through the arm 44, connection 45, arms 37, shaft 36, and arm 35 as the weft-fork slide is driven back in the manner above described. When the cam-bar 40 drops, the hooked portion 47 in the lower end of the lever 29 is 60 drawn in by the tension-spring 30 and hooked over the pin 46, as shown in Fig. 5. As the cam 39 rotates in the direction of the arrow the cam-arm 40 is thrown quickly upward, 65 carrying with it the upright lever 29 and

transferrer-lever 25, driving the plunger down and forcing a fresh cop 49 into the shuttle 50. As soon as the cam portion 39 has carried the cam-bar 40 to its extreme upward position the latch 41, under tension of the 70 spring 52, engages the notch 42 and prevents the cam-bar from falling again. Just at this point the rotating cam 51 engages the downwardly-extending end 56 of the lever 29, pushes it over and disengages the notch 47 75 from the pin 46, allowing this lever 29 to descend and the plunger and transferrer-lever to rise under tension of the plunger spring 22 encircling spindle 22^a, and by this motion the locking-pawl 31 is withdrawn from the 80 ratchet-teeth, the bell-crank released and, under tension of its actuating-weight 53, is drawn from the position shown in Fig. 1 over against the stop 55 and into the position 85 shown in Fig. 2, feeding the ratchet-wheel around one tooth and bringing a fresh cop into position under the plunger.

The operation of the device is further explained as follows: When the fork 33^a fails to 90 find the weft-thread, it is driven back in the usual way by the lever 34, and through the arms 35 and 37 and connection 45 the pawl 41 is withdrawn from the cam-bar 40, which latter is allowed to drop and ride on the cam 39. When this bar drops to the lower portion 95 of said cam, the upright lever 29 swings in by the action of the spring 30 above and the notched portion 47 engages the pin 46. As the cam revolves the quick rise in the cam acts on the bar 40 to force it quickly upward, 100 and as lever 29 is hooked onto the pin 46 it is also carried upward with a sudden impulse, and by this upward motion the rear end of the locking-pawl is allowed to rise and, under tension of spring 30, throws the locking end 105 into engagement with the ratchet-wheel, securely holding it and the cop-wheel from turning until said pawl has been again withdrawn. As the long end of the transferrer-lever 25 is thrown downward the set-screw 110 54, shown in said lever, engages the turned-over portion 20 of the finger 19 and forces it down onto the top edge of the arm 11, which act raises the end of the pawl 14 out of engagement with the teeth of the ratchet-wheel 115 and by a further downward movement of lever 25 the bell-crank lever is carried with its two pawls 13 and 14 downward from the position shown in Fig. 1 to that shown in Fig. 2, in which latter position it will be seen by the 120 dotted lines in Fig. 2 that pawl 13 has been carried down one tooth in the ratchet-wheel. Simultaneously with the movement of lever 25 the spindle 22 is depressed, and the plunger-foot 21 thereof forces a cop out from engagement 125 with the carrier and into the shuttle, as heretofore described. When the transferrer-lever 25 has been released and raised again, the weight 53 draws the lower arm of the bell-crank up to the stop 55, which feeds the cop- 130

carrier ahead one tooth, bringing a fresh cop into position to be struck down into the shuttle. The mechanism now stays in this, its normal position, which is that represented in Fig. 1, until the thread breaks or the filling runs out of the shuttle, when the operation above described is again repeated, driving fresh filling into the shuttle and at the same time ejecting the bobbin from the shuttle previously contained by it.

I claim as my invention—

1. A machine of the character described comprising a rotatable filling-feeder, a transferer, and operating means for said feeder supported independent of said transferer and intercepting the path of movement of the latter.

2. A machine of the character described comprising a rotatable filling-feeder, a transferer including a pivotally-mounted arm, and operating means for said feeder supported independently of said transferer and intercepting the path of movement of said arm.

3. A machine of the character described comprising a rotatable filling-feeder, a transferer, and a pawl-carrier supported independently of said transferer and adapted to impart movement to said feeder, said carrier being placed to intercept the path of movement of said transferer.

4. A machine of the character described comprising a rotatable filling-feeder, a transferer including a pivotally-mounted arm, and a pawl-carrier supported independently of said transferer and adapted to impart movement to said feeder, said carrier being placed to intercept the path of movement of said arm.

5. A machine of the character described comprising a rotatable filling-feeder, a transferer and a pawl-carrier supported independently of said transferer and adapted to impart movement to said feeder, said carrier being provided with a laterally-extended member adapted to intercept the path of movement of the transferer.

6. A machine of the character described comprising a rotatable filling-feeder, a transferer, a pawl-carrier supported independently of said transferer, a feeder-operating pawl carried thereby, and a feeder-locking pawl also carried thereby, said locking-pawl being provided with a member projecting into the path of movement of said transferer.

7. A machine of the character described comprising a rotatable filling-carrier, a transferer, a pawl-carrier supported independently of said transferer, a feeder-operating pawl carried thereby, and a feeder-locking pawl also carried thereby, said locking-pawl being provided with an arm projecting across said pawl-carrier and extended laterally into the path of movement of said transferer.

8. A machine of the character described

comprising a rotatable filling-feeder, a transferer, a pawl-carrier supported independently of the transferer and intercepting the path of movement of said transferer and arranged to be moved by the latter, and means for returning said pawl-carrier to its normal position, whereby said feeder is operated.

9. A machine of the character described comprising a rotatable filling-feeder, a transferer, a pawl-carrier supported independently of the transferer and intercepting the path of movement of said transferer and arranged to be moved thereby, means adapted to normally hold said pawl-carrier from movement, and means for limiting the movement of said pawl-carrier.

10. A machine of the character described comprising a rotatable filling-feeder, a transferer, operating means for said feeder mounted independently of said transferer and intercepting the path of movement of the latter, and a locking member controlled by said transferer and adapted to lock the feeder during the operation of said transferer.

11. A machine of the character described comprising a rotatable filling-feeder, a transferer, operating means for said feeder mounted independently of said transferer and intercepting the path of movement of the latter, and a locking member adapted to lock the feeder during the operation of the transferer, said member having an extension engaging said transferer, whereby the former is held in a normally inoperative position.

12. A machine of the character described comprising a rotatable filling-feeder, a transferer including a pivotally-mounted arm, operating means for said feeder mounted independently of said transferer and intercepting the path of movement of said arm, and a locking member pivoted adjacent said arm and adapted to lock the feeder during the operation of the transferer said locking member having an extension normally abutting against said arm.

13. A machine of the character described comprising a rotatable filling-feeder, a transferer, and operating means for said feeder arranged to intercept the path of movement of said transferer in the downward stroke of the latter, whereby said operating means is set.

14. A machine of the character described comprising a rotatable filling-feeder, a transferer including a pivotally-mounted arm, and operating means for said feeder arranged to intercept the path of movement of said arm in the downward stroke of the latter, whereby said operating means is set.

15. A machine of the character described comprising a rotatable filling-feeder, a transferer, and a pawl-carrier provided with a laterally-extended member adapted to inter-

cept the path of movement of said transferrer in the downward stroke of the latter.

16. A device of the character described comprising a rotatable feeder provided with means for supporting each one of a plurality of filling-carriers at one end, whereby the opposite end of each carrier is free.

17. A device of the character described comprising a rotatable filling-feeder having its periphery provided with a plurality of spring-clips each adapted to grasp one end of a filling-carrier, whereby the latter is supported with its opposite end free.

18. A device of the character described comprising a rotatable feeder provided with means for supporting each one of a plurality of filling-carriers at one end, whereby the opposite end of each carrier is free, and means for intermittently removing said filling-carriers and rotating said feeder.

19. A device of the character described comprising a rotatable feeder provided with means for supporting each one of a plurality of filling-carriers at one end, whereby the opposite end of each carrier is free, a transferrer adapted to remove said filling-carriers, and operating means for said carrier intercepting the path of movement of said transferrer.

20. A machine of the character described comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart movement to said feeder, and a cam for actuating said transferrer.

21. A machine of the character described comprising a rotatable feeder, a plunger-arm carrying a plunger, means operated by said arm to impart movement to said feeder, a lever connected to said arm, a rotating cam, and a cam-bar adapted to operate said lever.

22. A machine of the character described comprising a rotatable feeder, a plunger-arm carrying a plunger, means operated by said arm to impart movement to said feeder, a lever connected to said arm and provided with an upper hooked end, a locking member adapted to lock said feeder from movement during the operation of said plunger, a spring connecting the hooked end of said lever to said locking member, and means to periodically impart movement to said lever.

23. A machine of the character described comprising a rotatable feeder, a plunger-arm carrying a plunger, means operated by said arm to impart movement to said feeder, a lever connected to said arm, a locking member adapted to lock said feeder from movement during the operation of said plunger, said member having an extension abutting against said arm, a spring connecting one end of said lever with said locking member, and means for periodically imparting movement to said lever.

24. A machine of the character described comprising a rotatable feeder, a transferrer,

means operated by the transferrer to impart movement to said feeder, a lever pivotally connected to said transferrer, and means for periodically moving said lever, whereby the transferrer is operated.

25. A machine of the character described comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart movement to said feeder, a lever pivotally connected to said transferrer, a rotating cam, and a cam-bar operated by said cam and adapted to engage said lever, whereby said transferrer is operated.

26. A machine of the character described comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart movement to said feeder, a lever pivotally connected to said transferrer, a rotating cam, a cam-bar adapted to be operated by said cam and also adapted to periodically engage said lever, and means for normally holding said cam-bar out of the path of movement of said cam.

27. A machine of the character described comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart movement to said feeder, a lever pivotally connected to said transferrer, a rotating cam, a cam-bar adapted to periodically engage said cam, means whereby said bar is adapted to engage said lever, and means for normally holding said bar out of engagement with said lever.

28. A machine of the character described comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart movement to said feeder, a lever pivotally connected to said transferrer, a rotating cam, a cam-bar adapted to periodically engage said cam and also said lever, and means whereby said bar is held normally out of engagement with said cam and said lever.

29. A machine of the character described comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart movement to said feeder, a lever pivotally connected to said transferrer and provided with a shoulder, a rotating cam, and a cam-bar adapted to periodically engage said cam and having a pin adapted to periodically engage said shoulder.

30. A machine of the character described comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart movement to said feeder, a lever pivotally connected to said transferrer provided with a shoulder and a depending extension, a cam-bar adapted to periodically engage said shoulder, means for operating said cam-bar, and a rotating cam adapted to engage said depending extension, whereby said lever is disengaged from said cam-bar.

31. A machine of the character described comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart

movement to said feeder, a lever pivotally connected to said transferrer, a cam-bar adapted to periodically engage and move said lever, a weft-feeler, and means controlled by said weft-feeler for holding said cam-bar in a normally inoperative position.

32. A machine of the character described comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart movement to said feeder, a lever pivotally connected to said transferrer, a cam-bar adapted to periodically engage and move said lever, a weft-feeler, a locking-lever adapted to engage said cam-bar and hold the same normally inoperative, and connections between said weft-feeler and said locking-lever.

33. A machine of the character described

comprising a rotatable feeder, a transferrer, means operated by the transferrer to impart movement to said feeder, a lever pivotally connected to said transferrer, a locking member adapted to lock said feeder during the operation of said transferrer, a spring uniting one end of said lever with said locking member, a cam-bar adapted to periodically engage said lever, and means for periodically operating said cam-bar.

In testimony whereof I have hereunto set my hand this 12th day of September, A. D. 1904.

FELIX O'DONNELL.

In presence of—

HOWARD E. BARLOW,
FRANK A. FOSTER.